



Tap to Phone & Tap to Consumer Device Level 2 Testing and Approval Requirements

Visa Approval Services

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Contents

Tables	iv
Figures	v
Introduction	6
Audience.....	6
Key Terms and Acronyms Definition	6
Contact Information.....	8
1 Overview of Process.....	9
1.1 Testing at a Visa Accredited Test Laboratory.....	10
1.2 Self-testing Process Using a Visa Approved Test Tool.....	11
2 Scope of Testing	12
3 Registration and Agreements	13
3.1 Solution Provider Registration.....	13
3.2 Approval Services Testing Agreement.....	13
4 Submitting a Product for Laboratory Testing.....	14
4.1 TTP and TTCD Questionnaire, and Implementation Conformance Statement (ICS).....	14
4.2 Test Laboratory Scheduling	14
4.3 Testing Authorization.....	14
4.4 Testing Materials.....	15
4.4.1 Samples for Testing.....	15
4.4.2 Visa Ready Tap to Phone Kernel Specification (VRTPKS) & Visa Tap to Consumer Device (VTTCD) Compliance.....	15
4.4.3 Application Versions	16
4.4.4 Host Simulator or Software Development Kit (SDK).....	16
4.4.5 Operating Manual.....	16
4.5 Quality Assurance Testing	16
5 Submitting a Product for Self-testing.....	18
5.1 TTP / TTCD Questionnaire, and Implementation Conformance Statement (ICS).....	18
5.2 Testing Materials.....	18
5.2.1 Samples for Testing.....	18

Tap to Phone Level 2 Testing and Approval Requirements

5.2.2	Visa Ready Tap to Phone Kernel Specification (VRTPKS) & Visa Tap to Consumer Device (VTTCD) Compliance.....	19
5.2.3	Application Versions	19
5.2.4	Host Simulator or Software Development Kit (SDK).....	19
5.2.5	Operating Manual.....	19
6	Test Documentation and Tools.....	20
6.1	Test Plans.....	20
6.2	Commercial Test Tools and Test Scripts	20
6.3	Enhancements and Modifications	20
7	Functional Testing	21
7.1	Test Cycle.....	21
7.2	Test Scope	21
7.3	Test Scope Exclusions	21
7.4	Transaction Timing Measurements.....	21
8	Report Review	23
8.1	Test Laboratory Results.....	23
8.1.1	Product Fails Testing.....	23
8.1.2	Product Passes Testing	23
8.2	Self-testing Results	24
8.2.1	Product Fails Testing.....	24
8.2.2	Product Passes Testing	24
9	Approval Process	25
9.1	Product Compliance Notification	25
9.1.1	Product Compliance Notification for Lab Testing	25
9.1.2	Product Compliance Notification for Self-testing	25
9.2	Visa TTP / TTCD Compliant Kernels List.....	25
9.3	Compliance Recognition Validity	26
10	Changes to a Compliant Product	27
A	Appendix A – Revision History.....	28
B	Appendix B – Specification and Requirements.....	30
C	Appendix C – Application Checksum Implementation Rules.....	33

Tap to Phone Level 2 Testing and Approval Requirements

C.1	Visa Checksum Implementation Guidelines	33
C.1.1	TTP / TTCD Kernel Application Checksum	34
D	Appendix D – Reader Controller Requirements	35
E	Appendix E – Transaction Timing Requirements	36
E.1	Transaction Timing Measurement.....	36

Tables

Table 1-1: Key terms, acronyms and definitions 6

Table 10-1: Examples of changes to a compliant product that require retest.....27

Table A-1: Document revision history28

Table B-1: TTP / TTCD specification and associated documents30

Figures

Figure 1–1: Overview of the TTP / TTCD Level 2 testing and approval process..... 9

Figure 2–1: Scope of the product under test..... 12

Figure E-1: Transaction timing measurement for a TTP / TTCD transaction.....37

Introduction

This document describes the processes and requirements for testing a Tap to Phone (TTP) & Tap to Consumer Device (TTCD) kernel solution developed to the Visa Ready Tap to Phone Kernel Specification (VRTPKS) & Visa Tap to Consumer Device Kernel Specification (VTTCDD), respectively, also referred to as “Level 2 testing”. Level 2 testing is a requirement in the overall certification process for a Visa Ready Tap to Phone solution & Visa Tap to Consumer Device solution.

For Tap to Phone, please refer to the Visa Partner Portal for more information:

<https://partner.visa.com/site/programs/visa-ready/tap-to-phone.html>.

For Tap to Consumer Device, please refer to the Visa Tap Program for more information:

<https://digitalpartnerservices.visaonline.com/visatap>.

Audience

This document is for Tap to Phone & Tap to Consumer Device solution providers submitting kernels for Level 2 testing seeking Visa’s certification and approval.

Key Terms and Acronyms Definition

These key terms and acronyms are included for your reference.

Table 1-1: Key terms, acronyms and definitions

Term	Definition
Application Programming Interface (API)	A set of rules or interface that define how a Tap to Phone kernel application interacts or communicates with other applications in a Tap to Phone solution.
Android Package (APK)	A package file format used by the Android operating system for distribution and installation of the Tap to Phone application.
Approval Services Testing Agreement (ASTA)	Legal agreement signed by a solution provider to authorize Approval Services to accept, test and review its chip payment solution for a Visa approval. The agreement contains the terms of the Approval Services testing and approval process.
Consumer Device	A personal device, not purpose-built for payments, which is owned or managed by the cardholder with device-native NFC capabilities that is used to process, store, or transmit the

Introduction

Tap to Phone Level 2 Testing and Approval Requirements

Term	Definition
	cardholder's own payment credential for payment or non-payment purposes
Commercial off-the-shelf (COTS) device	A connected consumer mobile device (for example, a smartphone or tablet) that is designed for mass market distribution and not solely for payment acceptance. Per Visa Tap to Phone Framework, the applicable device can be used for payment acceptance with the device-native near field communication (NFC) and does not contain an embedded contact chip and/or magnetic stripe reader.
Implementation Conformance Statement (ICS)	A form that is submitted by the solution provider to Visa, to indicate features from an evaluated Visa specification that a product supports.
Letter of Compliance (LoC)	A communication by Approval Services that a specific Tap to Phone or Tap to Consumer Device kernel has successfully completed testing.
Quick Visa Debit/Credit (qVSDC)	A Visa application for payment transactions over a contactless interface.
Software Development Kit (SDK)	A set of development tools used to develop applications for a specific platform or operating system in an installable package.
Tap to Consumer Device (TTCD)	A contactless interaction that uses the native NFC capabilities of the device to collect Card data from contactless Cards, specifically for use cases in which a consumer taps a Card to a Consumer Device to provide evidence of possession of the Card.
Tap to Phone (TTP)	A technology that turns a merchant's NFC-enabled smartphone or tablet into a contactless payment terminal, eliminating the need for additional hardware.
Visa Contactless Payment Specification (VCPS)	A specification that defines Visa's requirements for conducting contactless transactions at point-of-sale (POS) devices. Includes requirements for cards. Compliance with this specification enables interoperability among Visa's global contactless payment programs.
Visa Ready Tap to Phone Kernel Specification (VRTPKS)	A specification that defines the technical differences between the requirements for a contactless reader kernel in VCPS and the contactless kernel that uses a mobile acceptance device's NFC capabilities to process Visa contactless transactions.
Visa Tap to Consumer Device Kernel Specification (VTTCD)	This specification defines the requirements for a contactless Kernel for Consumer Devices that use the native NFC capabilities

Tap to Phone Level 2 Testing and Approval Requirements

Term	Definition
	of the device to collect Card data from contactless Cards, specifically for use cases in which a consumer taps a Card to a Consumer Device to provide evidence of possession of the Card. The broader product requirements beyond the Kernel are defined in the relevant Visa Tap to Consumer Device Solution Requirements documents
Visa websites • Visa Partner Portal (VPP) • Visa Digital Partner Services (VDPS)	Secured areas of the sites are only accessible once the applicable Visa agreements have been executed. Visa Partner Portal: https://partner.visa.com/homepage.html Visa Digital Partner Services: https://digitalpartnerservices.visaonline.com/
Extensible Markup Language (XML)	A markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.

Contact Information

For questions about the contents of this document, please contact Approval Services at ApprovalServices@visa.com.

1 Overview of Process

The following is a high-level overview of the Level 2 testing and approval process.

Figure 1–1: Overview of the TTP / TTCD Level 2 testing and approval process



The first two stages are a one-time event as part of Visa Ready Tap to Phone Program / Visa Tap to Consumer Device Program onboarding process. The subsequent stages are repeated each time a solution is submitted for testing.

Although the overall process is the same, there are two options for performing V RTPKS / VTTCDD testing on a kernel:

1. Test at a Visa accredited test laboratory (see "[Section 1.1](#)").
2. The solution provider performs testing using a Visa qualified test tool or "self-testing" (see "[Section 1.2](#)")

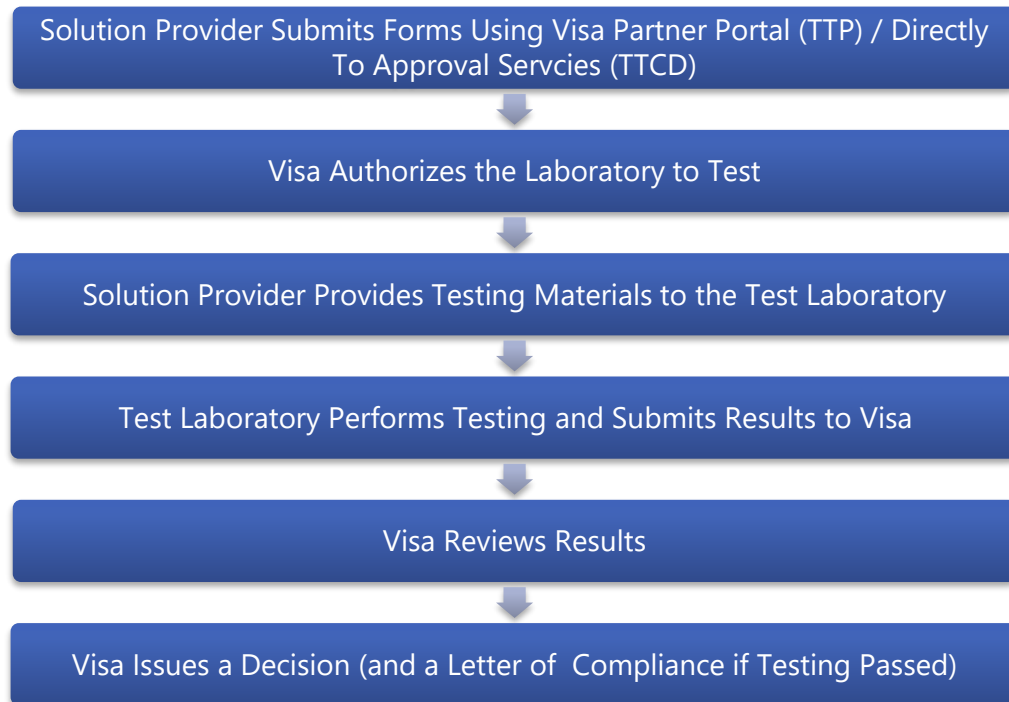
It is the solution provider's choice whether to use a test laboratory or self-testing test tool.

A list of accredited test laboratories and a list of qualified test tools can be found in the [Visa Partner Portal](#) library (requires a user account).

The lists are also available at Visa Digital Partner Services ([labs](#) and [tools](#)).

1.1 Testing at a Visa Accredited Test Laboratory

Figure 1–2: Testing and approval process for laboratory testing



1.2 Self-testing Process Using a Visa Approved Test Tool

Figure 1–3: Testing and approval process for self-testing



Once a solution provider has signed the necessary agreements and has been granted access to VDPS Self-Testing portal, it can submit a TTP and/or TTCD product on VDPS.

The solution provider can initiate and complete the forms online, execute testing itself with a Visa qualified tool at its own facilities, and submit the test results via VDPS.

Visa will review the product's test results for compliance with VRTPKS and/or VTTCD. Once a product is recognized as compliant, Visa will issue the review decision. The portal will send an email to the solution provider. A letter of compliance is attached if the product passes testing.

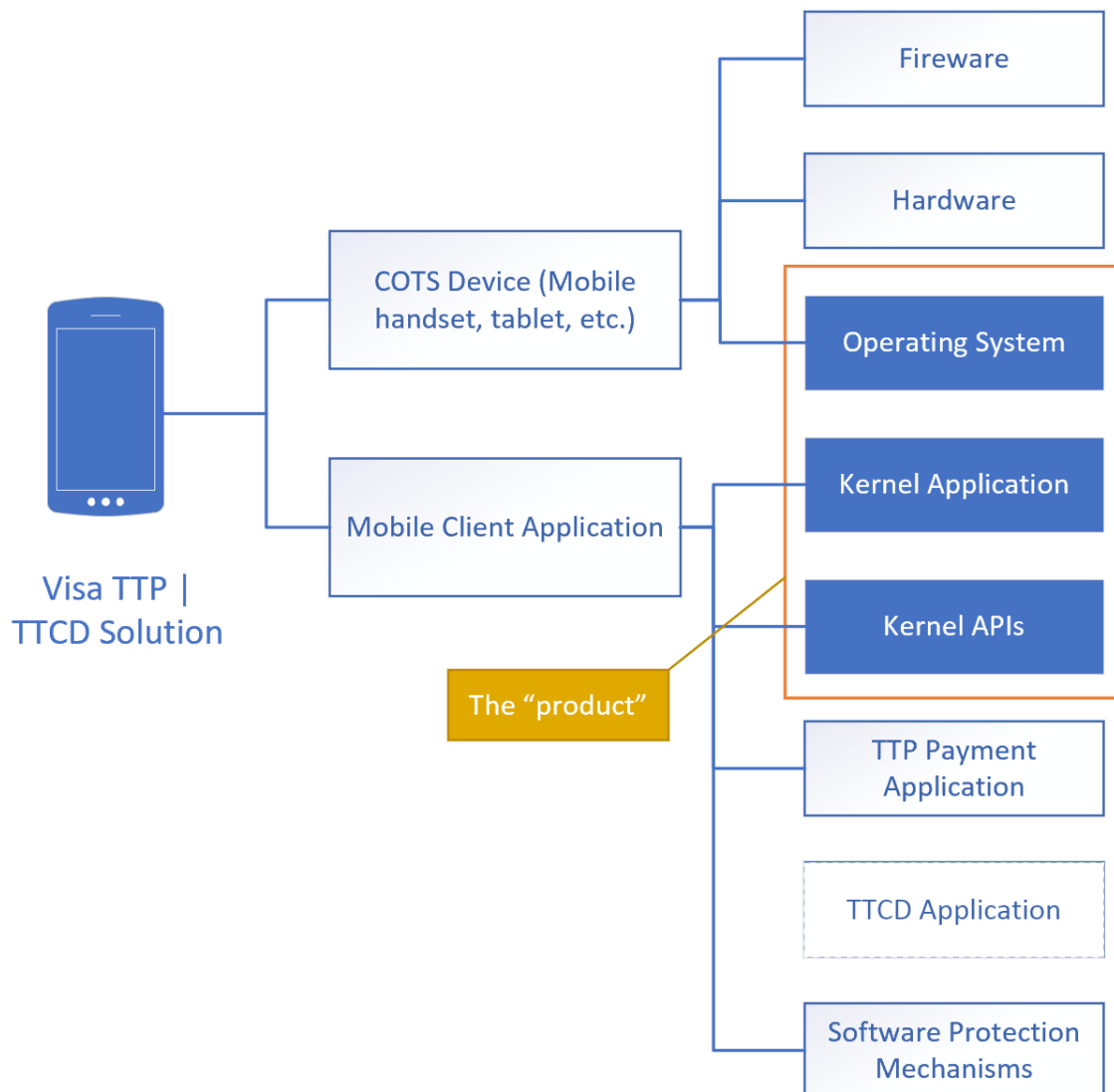
The portal provides tutorials, instructions, and testing requirements that the solution provider must comply with during the self-testing process. Failure to comply may result in a submission being rejected.

2 Scope of Testing

The product is a Visa kernel application that is developed to VRTPKS and/or VTTCDD, including its associated Visa Contactless Payment Specification (VCPS) and any kernel libraries or APIs that would interface with a mobile client payment application to function as a Visa Tap to Phone solution on a commercial off-the-shelf (COTS) device and/or as a Visa Tap to Consumer Device solution on a Consumer Device.

The product is tested and reviewed for compliance with VRTPKS and/or VTTCDD. The product's transaction timing is also measured as part of functional testing.

Figure 2-1: Scope of the product under test



3 Registration and Agreements

For Tap to Phone, all solution providers must register on the Visa Partner Portal, request to join the Visa Ready Tap to Phone Program, and execute an Approval Services Testing Agreement.

For Tap to Consumer Device, all solution providers must register on the Visa Digital Partner Services, request to join the Visa Tap Program, and execute an Approval Services Testing Agreement.

3.1 Solution Provider Registration

The Visa Tap team manages the registration process and onboarding for the Tap to Phone Program and the Visa Tap Program.

For Tap to Phone, go to the Visa Partner Portal at <https://partner.visa.com/site/programs/visa-ready/tap-to-phone.html> to register for an account and request to join the Visa Ready Tap to Phone Program.

For Tap to Consumer Device, go to the Visa Digital Partner Services – Visa Tap Program at <https://digitalpartnerservices.visaonline.com/visatap> to register for an account and request to join the Visa Tap Program.

3.2 Approval Services Testing Agreement

Once the solution provider has completed the registration and onboarding, it is required to sign an Approval Services Testing Agreement.

This agreement governs the testing and approval process. Once the solution provider executes the agreement, it can have access to confidential testing materials like test plans and other related material on Visa websites.

For Tap to Phone, once an applicable solution provider has submitted its solution on the [Visa Partner Portal](#), Approval Services will initiate the testing agreement (ASTA signing) process.

For Tap to Consumer Device, once an applicable solution provider has registered for the Visa Tap Program, please contact Approval Services at ApprovalServices@visa.com to initiate the test agreement (ASTA signing) process.

Contact Approval Services at ApprovalServices@visa.com with any questions about this agreement.

4 Submitting a Product for Laboratory Testing

The following section describes the requirements for submitting a product to start the Level 2 testing process where a test laboratory will perform VRTPKS and/or VTTCDD testing.

4.1 TTP and TTCD Questionnaire, and Implementation Conformance Statement (ICS)

The solution provider downloads the TTP and TTCD Questionnaire and ICS document from its [Visa Partner Portal](#) library (requires a user account) or Visa Digital Partner Services – Visa Tap Program.

The questionnaire captures the product details. The ICS captures the optional features in the Visa specifications that the product supports.

For Tap to Phone, once completed, the solution provider uploads the questionnaire and ICS to the Visa Partner Portal to submit its product.

For Tap to Consumer Device, once completed, the solution provider sends the questionnaire and ICS to Approval Services.

Approval Services will review for completeness and work with the solution provider to address any issues. Any corrections will require the solution provider to re-upload the updated document for its submission.

Once the form is accepted, Approval Services issues a unique Visa reference number for the submission and authorizes the chosen test laboratory to proceed with official testing, attaching a copy of the questionnaire and ICS.

4.2 Test Laboratory Scheduling

The solution provider selects a test laboratory from the “Visa Accredited Testing Laboratories” list located in the [Visa Partner Portal](#) library (requires a user account) or at [Visa Digital Partner Services](#).

The solution provider and test laboratory are responsible for scheduling testing.

4.3 Testing Authorization

Official testing cannot begin until the test laboratory has received the testing authorization from Approval Services.

Testing authorization is exclusive to each test cycle.

The solution provider can instruct the test laboratory to perform as many iterations of testing as necessary after each testing authorization.

Once the iterations are completed and the solution provider is ready to start a new test cycle, it will update the product questionnaire and ICS with details of changes made to the product and submit to the Visa Partner Portal for Tap to Phone or submit to Approval Services for Tap to Consumer Device.

Approval Services will review for completeness and work with the solution provider to address any issues. Any corrections will require the solution provider to re-upload the updated document for its submission.

Once the form is accepted, Approval Services issues a unique Visa reference number and authorizes the chosen test laboratory to proceed with a new test cycle, attaching a copy of the updated questionnaire and ICS.

4.4 Testing Materials

The following section describes the requirements for testing materials.

Important: Visa may, at any time, request the solution provider to provide testing materials, including product samples that are identical to the samples tested, if additional testing is required to investigate product issues or potential non-compliance after a Letter of Compliance is issued.

4.4.1 Samples for Testing

The solution provider must submit at least one sample of the product to the test laboratory.

Note: The laboratory may return the sample(s) after Visa issues a verdict.

4.4.2 Visa Ready Tap to Phone Kernel Specification (VRTPKS) & Visa Tap to Consumer Device (VTTCD) Compliance

For TTP solution, the kernel application must be compliant with a valid and not yet sunset VRTPKS version, including its associated specifications and references.

For TTCD solution, the kernel application must be compliant with a valid and not yet sunset VTTCD version, including its associated specifications and references.

4.4.3 Application Versions

The kernel application and operating system versions in the sample must be as stated in the questionnaire.

Important: Visa does not test proprietary or domestic applications as part of the testing process. In particular, the following are outside the scope of testing: Non-Visa applications (for example, mobile client payment applications, loyalty, coupons, other payment brand kernels etc.), and specific message formats, record layouts, and protocol handling from the product to an acquirer or payment facilitator host system or a mobile communication network.

4.4.4 Host Simulator or Software Development Kit (SDK)

For Tap to Phone, all sample units must be accompanied by a host simulator or SDK software that emulates a host authorization for online qVSDC transactions.

Subject to the architecture of the product, the simulator or SDK must be able to:

- Perform approvals or decline online qVSDC transactions.
- Allow the user to review and evaluate that the data elements captured from the product under test are compliant with Visa specifications.

For Tap to Consumer Device, all sample units must be accompanied by a software simulator or SDK software that emulates a backend service for online chip data processing.

Subject to the architecture of the product, the simulator or SDK must be able to:

- Allow the user to review and evaluate that the data elements captured from the product under test are compliant with Visa specifications.

4.4.5 Operating Manual

The solution provider must provide a soft copy operating manual that describes the requirements and operating procedures to set up the product for testing.

4.5 Quality Assurance Testing

Test laboratories may offer quality assurance (QA testing) or debug testing as part of their testing services. The option enables the solution provider to test their product with the test laboratory's test facilities to identify and fix non-compliance issues prior to official testing.

The QA testing process is managed by the test laboratory. Visa is not involved in the process and does not review QA test results or accept the results for official review.

Important: Visa's official testing authorization is not required for the QA testing process.

5 Submitting a Product for Self-testing

The following section describes the requirements for submitting a product at the “[Self-Testing Portal](#)” on Visa Digital Partner Services to start the Level 2 testing process where the solution provider will perform VRTPKS and/or VTTCDD testing.

5.1 TTP / TTCD Questionnaire, and Implementation Conformance Statement (ICS)

The solution provider logs on to the [self-testing portal](#) (requires a user account) and completes an online questionnaire and ICS form.

The questionnaire captures the product details. The ICS captures the optional features in the Visa specifications that the product supports.

Once complete, the solution provider submits the form. If accepted, the portal issues a unique Visa reference number for the submission. The solution provider downloads the ICS form as an XML file for uploading to the test tool.

If the forms are rejected, the solution provider will be prompted by the portal to correct any issues.

5.2 Testing Materials

The following section describes the requirements for testing materials.

Important: Visa may, at any time, request the solution provider to provide testing materials, including product samples that are identical to the samples that were tested by the solution provider, if additional testing is required to investigate product issues or potential non-compliance after a Letter of Compliance is issued.

5.2.1 Samples for Testing

The solution provider must use a sample device that is identical to the device stated in the questionnaire.

5.2.2 Visa Ready Tap to Phone Kernel Specification (VRTPKS) & Visa Tap to Consumer Device (VTTCD) Compliance

For TTP solution, the kernel application must be compliant with a valid and not yet sunset VRTPKS version, including its associated specifications and references.

For TTCD solution, the kernel application must be compliant with a valid and not yet sunset VTTCD version, including its associated specifications and references.

5.2.3 Application Versions

The kernel application and operating system versions in the sample must be as stated in the questionnaire.

Important: The solution provider should not test its own proprietary or domestic applications as part of the testing process outlined in this document. In particular, the following are outside the scope of this testing: Non-Visa applications (for example, mobile client payment applications, loyalty, coupons, other payment brand kernels etc.), and specific message formats, record layouts, and protocol handling from the product to an acquirer or payment facilitator host system or a mobile communication network.

5.2.4 Host Simulator or Software Development Kit (SDK)

The solution provider must use a host simulator or SDK software that emulates host authorization for online qVSDC transactions.

Subject to the architecture of the product, the simulator or SDK must be able to:

- Approve or decline online qVSDC transactions.
- Allow the user to review and evaluate that the data elements captured from the product under test comply with Visa specifications.

5.2.5 Operating Manual

Upon Visa's request, the solution provider must be able to provide a soft copy operating manual that describes the requirements and operating procedures to set up the product for testing.

6 Test Documentation and Tools

Visa's test plans, test scripts and associated documentation are available to assist solution providers with their QA testing prior to official testing.

Successful completion of test scripts execution does not imply an official recognition until Visa reviews the test results from official testing and issues a verdict.

Visa reserves the right to develop and implement additional tests that are not part of the current test plan. Visa may subject the product tested at the test laboratory to additional physical and situation-specific tests as necessary.

6.1 Test Plans

Visa Tap to Phone test plans are available for download from the [Visa Partner Portal](#) library (requires a user account) once the Approval Services Testing Agreement has been signed.

Visa Tap to Consumer Device test plans are available for download from the Visa Digital Partner Services – Visa Tap Program library (requires a user account) once the Approval Services Testing Agreement has been signed.

6.2 Commercial Test Tools and Test Scripts

Commercial Tap to Phone / Tap to Consumer Device test tools and test scripts developed to support Visa's test plans are available from Visa qualified test tool providers.

Please refer to the "Visa Test Tool Providers Contact Information" list in the Visa Partner Portal library and at a [public page](#) on Visa Digital Partner Services.

6.3 Enhancements and Modifications

Test plans and test scripts are subject to enhancements and modifications at any time. Test plan revisions are accumulated and made available to solution providers with new releases, as determined by Visa. It is the solution provider's responsibility to ensure that it has the most current test plan. The solution provider should contact its test tool supplier to obtain any test scripts updates.

7 Functional Testing

7.1 Test Cycle

A test cycle is a set of applicable test scripts to be executed on any single version of the product during Visa's testing process.

A successful test cycle is defined as completion of all the executed test scripts with no issues or failures.

7.2 Test Scope

A TTP product is tested according to the VRTPKS version and functionalities declared in the Implementation Conformance Statement (ICS) form. The product is tested with test scripts that are based on the latest version of the VRTPKS test plan.

Testing focuses solely on the Visa kernel application and any of its supporting libraries or APIs that impact the kernel's VRTPKS functionalities.

A TTCD product is tested according to the VTTCDD version and functionalities declared in the Implementation Conformance Statement (ICS) form. The product is tested with test scripts that are based on the latest version of the VTTCDD test plan.

Testing focuses solely on the Visa kernel application and any of its supporting libraries or APIs that impact the kernel's VTTCDD functionalities.

7.3 Test Scope Exclusions

The following are excluded from the functional testing scope:

- Hardware, firmware or proprietary software, including the device, mobile client application or software protection mechanisms that exist in the product.

7.4 Transaction Timing Measurements

Transaction timing measurement enables Visa to evaluate that the TTP and/or TTCD product is compliant with the transaction timing requirements for card and reader interaction, as stated in the Visa Contactless Payment Specification (VCPS) referenced in VRTPKS and VTTCDD.

For lab testing, the test laboratory will measure the product's transaction timing and submit the results to Visa for review.

The total time used by the reader must not exceed 100 milliseconds.

Important: For self-testing, the solution provider will attest on the online questionnaire that its submitted product is compliant with Visa's transaction timing requirements.

8 Report Review

The following section describes the process of submitting test results to Approval Services for review. The process is different for lab testing and self-testing.

8.1 Test Laboratory Results

Upon completion of functional testing, the test laboratory will submit an official test report outlining the test results to the solution provider for review. The solution provider is required to authorize the test laboratory to release the test report to Approval Services to review for an official decision.

Important: The test laboratory is required to submit all test results to Approval Services within 180 days from the official testing authorization.

There are two possible outcomes of a Tap to Phone / Tap to Consumer Device product testing.

8.1.1 Product Fails Testing

The test laboratory sends a report to the solution provider identifying the failed tests from functional testing and the reasons for failure.

The solution provider can choose to resubmit a failed product for a new test cycle with the following steps:

- Rectify the identified failures or issues.
- Complete a new questionnaire and ICS form with details of the changes made for a new test cycle.
- Schedule a new test slot at the chosen test laboratory.
- Provide new testing materials to the test laboratory.

8.1.2 Product Passes Testing

The test laboratory sends a final test report for functional testing to the solution provider for review.

The solution provider determines if it wishes to submit the test results to Approval Services for review. The solution provider will then officially authorize the lab to submit an electronic copy of the final test report and all associated testing forms and documents to Approval Services for review.

8.2 Self-testing Results

The Visa test tool identifies test cases that are applicable based on the digitized ICS form. All applicable test cases must be executed for each test cycle.

Solution providers who execute testing themselves are advised to review the test results carefully. All tests are expected to pass on a product that is fully compliant with VRTPKS and/or VTTCDD.

The self-testing portal will reject a test report with incomplete test results (for example, with missed test cases, or non-applicable test cases) or when there are failures in the test results.

8.2.1 Product Fails Testing

The solution provider is required to review failures at each test cycle and fix the issues before starting a new test cycle.

The solution provider can resubmit the test report if questionnaire and ICS do not change; or submit a new product if there's an update on questionnaire and/or ICS.

8.2.2 Product Passes Testing

The solution provider reviews the test results to ensure that all required test cases are executed successfully and passed. The solution provider then uploads the test report at the portal.

Important: The solution provider must comply with the user guidelines and instructions on the self-testing portal for report submissions.

9 Approval Process

The following section describes the process and rules governing the compliance recognition of a TTP and/or TTCD product.

9.1 Product Compliance Notification

Visa reviews the test reports submitted by the test laboratory to determine if the product is compliant with the evaluated Visa specifications. Based on the review outcome, Visa determines if the product passes or fails testing.

A Letter of Compliance (LoC) certifies the product as a Visa compliant product.

9.1.1 Product Compliance Notification for Lab Testing

Visa will send a product compliance notification email to the person who submitted the questionnaire and ICS form.

A letter is attached to the email if the product passes testing and is recognized as compliant by Visa. The letter is addressed to the solution provider's appointed letter addressee, as registered with Visa.

9.1.2 Product Compliance Notification for Self-testing

The portal will send a product compliance notification email to the person who submitted the online questionnaire and ICS form.

If the product passes testing, a letter is generated from VDPS and user can download it immediately. It's also attached to the email notification sent to the product submitter.

9.2 Visa TTP / TTCD Compliant Kernels List

Upon successful completion of official testing and issuance of Letter of Compliance, the TTP / TTCD product will appear on the [Visa Approved Products - Tap to Phone / Tap to Consumer Device Compliant Kernels page](#) on VDPS, unless the solution provider notifies Visa in writing to exclude its product from the list.

9.3 Compliance Recognition Validity

Unless otherwise stated in the Letter of Compliance, the period of time a TTP / TTCD product is viewed as “compliant” is typically 3 years from the date of the letter issuance.

If the solution provider wants to extend the life of its product’s compliance recognition, it should resubmit the product as a new submission, prior to the expiry date.

10 Changes to a Compliant Product

A retest may be required if the solution provider makes changes to a product that was recognized as compliant. The following are examples of changes that will require a retest.

For changes that are not listed, please contact Approval Services with details to determine the type of testing required.

Table 10–1: Examples of changes to a compliant product that require retest

Type of change	Description
Operating System (OS) Changes	Adding, deleting, or modifying codes in the operating system that results in recompilation of the compliant kernel or affects its VRTPKS / VTTCD functionalities.
Kernel Application Changes	Changes or bug fixes to the compliant kernel and/or its corresponding libraries or its VRTPKS / VTTCD functionalities that result in the recompilation of the kernel.
Payment Application Changes	Changes or bug fixes to a payment application that result in the recompilation or affect the VRTPKS / VTTCD functionalities of the compliant kernel and its corresponding libraries.
Security Changes	Changes to the components or elements in the product's security evaluation scope that result in the recompilation of the kernel or affect the VRTPKS / VTTCD functionalities of the compliant kernel and its corresponding libraries.

A Appendix A – Revision History

Table A-1: Document revision history

Version	Date	Description
3.0	September 1, 2026	Release with updates to include TTCD and the self-testing process.
2.3	March 21, 2022	Updated "Key Terms and Acronyms" • Replaced "COTS device" and its definition with the latest terminology and definition of a "Visa Ready Tap to Phone Program qualified device". • Added definition for "Visa Ready Tap to Phone Program". Updated "Scope of Testing" • Updated the definition of a Tap to Phone kernel product. • Removed references to a COTS device. • Defined the scope of a "distributed kernel solution". • Updated Figure 2-1 and add Figure 2-2 as visuals for the scope of testing. Expanded the definition of the ICS in Section 4.1. Replaced the terminology of "Visa Recognized Testing Laboratories" with "Accredited Test Laboratories" in Section 4.2 and Appendix B. Replaced the terminology of "Visa Test Tool Providers Contact Information" with "Approved Test Tools" in Section 5.2 and Appendix B. Updated "Payment application changes" in Table 9-1 to "Non-Visa application changes". Added "application digital signature" to the checksum definition in Appendix C1.1.
2.2	February 1, 2021	Updated Figure 2-1 include the operating system in the "product" scope. Updated Section 6.3 to remove "operating system" from functional test scope exclusion.
2.1	January 18, 2021	Updates to Visa Ready Tap to Phone program contact email and various sections of the document for language and description clarity.
2.0	December 21, 2020	New document format. Includes process updates for the technology partner workflow on the Visa Partner Portal, removal of the letter of approval (LoA)

Changes to a Compliant Product

Tap to Phone Level 2 Testing and Approval Requirements

Version	Date	Description
		process for kernel and payment application submissions and incorporated Visa kernel checksum implementation rules in Appendix C.
1.0	August 19, 2020	1 st release

B Appendix B – Specification and Requirements

This appendix lists Visa specifications and associated documents, requirements or tools that apply to the testing of a TTP / TTCD product and where each can be obtained.

Table B-1: TTP / TTCD specification and associated documents

Specification	Description	Available at
Visa Contactless Payment Specification: Reader Specification 2.2.4 and update lists (VCPS)	Defines the requirements for conducting Visa contactless transactions at point-of-sale (POS) devices. Includes requirements for cards, POS devices and chip data messages. Compliance with this specification enables interoperability among Visa's global contactless payment programs.	VDPS library Log in is required.
Visa Ready Tap to Phone Kernel Specification and update lists (VRTPKS)	Defines the technical differences between the contactless kernel defined in VCPS and the contactless kernel for mobile acceptance devices that use the NFC capabilities of the mobile device to process Visa contactless transactions.	VDPS library Log in is required.
Visa Tap to Consumer Device Kernel Specification (VTTCD)	This specification defines the requirements for a contactless Kernel for Consumer Devices that use the native NFC capabilities of the device to collect Card data from contactless Cards, specifically for use cases in which a consumer taps a Card to a Consumer Device to provide evidence of possession of the Card. The broader product requirements beyond the Kernel are defined in the relevant <i>Visa Tap to Consumer Device Solution Requirements</i> documents [VTTCDReq], which are use case	VDPS library Log in is required.

Changes to a Compliant Product
Tap to Phone Level 2 Testing and Approval Requirements

Specification	Description	Available at
	specific. This Kernel is hereafter referred to in this specification as the "Tap to Consumer Device Kernel" or the "TTCD Kernel". As contactless Kernels implemented strictly to the <i>Visa Contactless Payment Specification (VCPS): Reader Specification</i> [VCPS Reader Specification] are not appropriate for use in this environment, this specification provides the explicit requirements for Tap to Consumer Device Kernels to ensure that TTCD Device applications can meet the needs outlined in [VTTCDDReq] and to facilitate simpler certification for TTCD Kernels.	
Visa Ready Tap to Phone Kernel Specification (VRTPKS) Test Plan	Defines test cases, test configurations, test procedures and expected outcome to evaluate a product's compliance with the requirements of the Visa Ready Tap to Phone Kernel Specification (VRTPKS) and update lists, where applicable.	VDPS library Log in is required.
Visa Tap to Consumer Device (VTTCDD) Test Plan	Defines test cases, test configurations, test procedures and expected outcome to evaluate a product's compliance with the requirements of the Visa Tap to Consumer Device Kernel Specification (VTTCDD).	VDPS library Log in is required.
Reader Controller Development Kit	Guidelines for automated Functional Testing, including a toolkit with companion guide, code snippets, and verifier tool to develop and test a Reader Controller implementation on the solution provider's product.	VDPS library Log in is required.
Visa Accredited Testing Laboratories	List of Approval Services accredited Functional Test Laboratories for Visa chip	VDPS library

Appendix B – Specification and Requirements

Tap to Phone Level 2 Testing and Approval Requirements

Specification	Description	Available at
	payment products testing, including TTP and TTCD.	
Visa Approved Test Tool Providers Contact Information	List of Visa qualified test tool providers and test tools that are available for Visa test plans.	VDPS library

C Appendix C – Application Checksum Implementation Rules

The kernel application checksum (kernel checksum) is mandatory in each submitted form.

The checksum ensures that the kernel application is stable when submitted for testing and is used to identify changes to the product during testing or after testing has completed.

Important: All sample units must include a mechanism for the user to easily retrieve and view the checksum values.

C.1 Visa Checksum Implementation Guidelines

The kernel application shall have a unique checksum value.

The checksum computation should include:

- Components or elements of the kernel that support all mandatory and applicable optional requirements of the evaluated specification.
- The static bits of the "Terminal Transaction Qualifier" (TTQ).

For a kernel application that is made up of several software modules (for example, external routines, libraries, etc.):

- Each software module shall have a unique checksum.
- The kernel checksum is computed as an overall checksum of all the software modules' checksum values.
- Any changes in a software module should generate a new unique checksum value of the changed module.
- The checksum generation algorithm shall generate a unique value each time a software module is changed. The method or algorithm for checksum generation is left to the discretion of the solution provider.
- The sample unit(s) for the product shall contain a software mechanism that easily retrieves the checksum values of all related software modules when these are loaded into the sample unit.
- When used, this software mechanism shall dynamically compute the kernel checksum.

In addition, the following requirements apply to a Tap to Phone / Tap to Consumer Device product.

C.1.1 TTP / TTCD Kernel Application Checksum

The solution provider should state the kernel checksum or the certificate value of a signed application package (APK) in the questionnaire. The kernel checksum value is the overall checksum of the kernel and its libraries or APIs that support the features of VRTPKS / VTTCDD and associated specifications.

The kernel checksum should exclude the checksum of any other applications that exist or are integrated with the kernel. For example, the mobile client application and its libraries.

C.2 Checksum Retrieval and Validation

The test laboratory will validate that the kernel checksum value retrieved from the product under test is identical to the kernel checksum value declared in the questionnaire.

The official test report submitted to Visa shall include:

- Validation results for the kernel checksum.
- Validation results for the individual software modules' checksums, if the kernel application implementation is made up of several software modules.

C.3 Changes to a Kernel Application Checksum

The kernel application checksum value stated in the questionnaire should not change.

- It is considered a major change if the kernel checksum value is different from what was stated in the questionnaire.
- The solution provider is required to resubmit a new questionnaire to Visa for a new test cycle, with details of the change and the new kernel checksum value.

D Appendix D – Reader Controller Requirements

The solution provider can fully automate functional testing by developing a reader controller software in the submitted product.

The reader controller software interfaces with the product and test tool to automate the test configurations set up and test responses during testing.

Visa's "Reader Controller Development Kit" is made available to the solution provider when the ASTA is executed. The kit contains a companion guide, code snippets, a reader controller verifier tool and a test card personalization XML file for the solution provider to develop and test its reader controller implementation.

The kit can be downloaded from the [Visa Digital Partner Services library](#) (requires a user account).

The solution provider must include the reader controller software in the sample unit(s) that are submitted to the lab or used for self-testing, if it opts for fully automated functional testing.

Important: Implementation of this requirement is optional for both lab testing and self-testing.

E Appendix E – Transaction Timing Requirements

Transaction timing measurement enables Visa to evaluate that the TTP / TTCD product is compliant with the transaction timing requirements for card and reader interaction as stated in the Visa Contactless Payment Specification: Reader Specification (VCPS) referenced in VRTPKS / VTTCD.

The total time used by the reader must not exceed 100 milliseconds.

Note: This appendix explains how Visa measures the transaction timing for a TTP / TTCD product.

E.1 Transaction Timing Measurement

The following are the steps to measure and calculate the time it takes for a product to complete a Visa contactless transaction.

- At each device command-card response pair, measure the duration from the last byte of the card response to the last byte of the next device command.
- Measure the duration for each device command-card response pair in the transaction.
- Add up all the duration measurements to determine the overall time it takes to complete the transaction.

Important: The solution provider will check an attestation for “Transaction Timing on VCPS” on the online questionnaire for a self-testing submission.

Figure E-1: Transaction timing measurement for a TTP / TTCD transaction

